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ABSTRACT

Examined with 63 educationally handicapped (EH) students (6-14 years old) was the effect on academic gains of special class placement, consisting of a self-contained EH class on the elementary level or a learning disabilities group on the elementary, junior high, or high school level. Analyses of data from the Ss' district records provided information in the following areas (results are in parentheses): academic gains of total population (Ss improved significantly in the subtest of word recognition, but not spelling or arithmetic), oldest vs. youngest (no significant differences on any of the subtests), longest vs. shortest time in remedial study (Ss with shortest time made significantly higher gains in word recognition than Ss with a longer time), highest vs. lowest IQ (significant gains were shown for those Ss having the lowest IQ scores), and correlations between subtest and IQ (no significant correlations). (1M)

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ACADEMIC ACHIEVEMENT OF STUDENTS BEFORE AND
DURING PLACEMENT IN CLASSES FOR THE
EDUCATIONALLY HANDICAPPED

by

Bonnie Ann Krumholz

A Thesis Presented to the
FACULTY OF THE GRADUATE SCHOOL
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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
LIST OF FIGURES	v
LIST OF TABLES	vi
Chapter	
I. INTRODUCTION AND LITERATURE REVIEW	1
Academic Gains of Total Population	14
Comparison of Academic Gains of the Fifteen Youngest Subjects and the Fifteen Oldest Subjects	15
Comparison of Academic Gains of the Fifteen Subjects with the Longest Enrollment and the Fifteen Subjects with the Shortest Enrollment	15
Comparison of Academic Gains of the Fifteen Subjects with the Highest IQ Scores and the Fifteen Subjects with the Lowest IQ Scores	16
Correlation between Academic Gains and IQ Scores	17
II. METHOD	18
Subjects	18
Procedure	20
III. RESULTS	23
Academic Gains of Total Sample	27
Subsamples	29
Oldest vs. Youngest	29
Longest vs. Shortest	31
Highest IQ vs. Lowest IQ	33
Correlations between Gains and IQ Scores . .	36

Chapter	Page
IV. DISCUSSION	38
Academic Gains of Total Population	39
Oldest vs. Youngest	39
Longest vs. Shortest	40
Highest vs. Lowest	41
Correlations between Subtests and IQ	43
V. IMPLICATIONS	46
REFERENCES	50

LIST OF FIGURES

Figure	Page
1. Average Progress per year based on Grade Placement Before and During EH Class Placement	24

LIST OF TABLES

Table		Page
1.	Comparison of Mean Gains per year in each Subtest of the WRAT Before and After EH Class Placement	25
2.	Total Mean Gains During EH Class Placement . .	26
3.	Mean Standard Scores Before and After EH Class Placement	27
4.	Difference between Mean Gains of Standard Scores Before and After EH Class Placement as measured by Standard Scores on each Subtest of the WRAT	28
5.	Difference between Mean Gains of Oldest Subjects and Youngest Subjects as measured by Standard Scores on each Subtest of the WRAT	30
6.	Difference between Mean Gains of Subjects enrolled the Longest and Subjects enrolled the Shortest as measured by Standard Scores on each Subtest of the WRAT	32
7.	Additional Comparisons for Subjects enrolled Longest and Subjects enrolled Shortest	33
8.	Difference between Mean Gains of Subjects with Highest IQ and Subjects with Lowest IQ Scores as measured by Standard Scores on each Subtest of WRAT	34
9.	Additional Comparisons for Highest IQ vs Lowest IQ Subjects	35

10. Correlation between Gain Scores & IQ Scores of Total Sample as measured by Standard Scores on Three Subtests of WRAT	37
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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

The question of the value of special class intervention has arisen repeatedly since the development of "segregated" education. It has been the opinion of many educators in the past that retarded children should be separated from the normal child for a number of reasons. In the segregated class, the retarded child would be educated at a level at which he can function more adequately. Advocates of special classes for Educable Mentally Retarded (EMR) children, according to Meyerowitz (1962), have contended that among other advantages, these classes promote in the children the acquisition of a more nearly realistic and healthy self concept.

One of the fundamental purposes of a special class is to provide the kind of environment and social and emotional climate that should encourage the development of appropriate attitudes and learning. The segregated class is designed to provide individualized attention and instruction so as to maximize learning potentials. It has been believed in the past that a retarded child in a regular class would be left behind, would be unable to

function, and would achieve less than his potential. In addition, he would be rejected by his peers. In contrast to this, the EMR child would have a much greater opportunity to realize his full potential, both academic and social, in a class where he would be with children closer to his own ability. In addition, he would find a social and emotional atmosphere more suited to his own level of functioning than he might find in the regular class.

Recently, similar types of special class interventions have been introduced into the school systems for the Educationally Handicapped (EH) child. Such programs can run for a full day as in a self-contained class, or partial day academic instruction, frequently referred to as Learning Disability Groups (LDG). Because of the "newness" of such programs, very little research has been done to determine the effects of such programs. Thus, background information concerning related studies of EMR classes will be presented.

Numerous studies have been undertaken to determine the validity of the following assumption: Do EMR children make greater academic, social and emotional gains in segregated classes than they do if allowed to remain in the regular class comprised mostly of normal children? Much evidence has been produced based on the evaluation of special class intervention for EMRs yielding both positive

and negative results. However, no solid evidence has been produced to justify EH class intervention.

Prior to 1950, very little research was done to determine whether any differences existed between regular class and special class placement of EMR children. In an early study, Bennett (1932) compared fifty mentally retarded children in special classes with an equated group who were enrolled in regular classes. The results of her study showed that in all school achievement tests, the special class children obtained lower scores than the retarded children who remained in the regular grades. Much question has been raised as to the validity of this study, however, since the samples were not unbiased. According to Kirk (1964), "Mentally retarded children who are inferior educationally and physically are the ones who are most apt to be referred to special classes, while those with similar IQs but with less severe educational retardation or fewer behavior problems are less frequently referred for special class placement" (p. 344). The subjects (Ss) for the Bennett study were drawn from two school districts, one with all EMR children in special classes, and one with some EMR children in regular and some in special classes. Kirk's statement makes reference to the fact that, in the district with all EMRs in special classes, the range of abilities would conceivably run from low ability to highest ability EMRs, and achievement

levels would be based on an average of these children. In the other district, those EMRs with the highest ability were enrolled in regular classes, and those with the lowest ability and/or most severe problems were enrolled in special classes. The achievement of those EMR children in the regular classes would be based on an average of the highest ability EMR children only. Thus, those in regular classes would be more likely to achieve better academically purely by the fact that they were already at a higher level. The results of this study are therefore not conclusive evidence.

A similar study by Pertsch (1936) followed, and his results supported those of the Bennett study. Pertsch found that the regular class group performed significantly better academically than the special class group. However, the sample was again biased by similar factors as those affecting the Bennett study.

Johnson (1950) conducted a sociometric investigation of mentally handicapped children enrolled in regular classes. His results showed that their peer acceptance scores were significantly lower than were the scores of the normal children enrolled in the same grades. Children with lower IQ scores were rejected far more frequently than those with higher scores; rejection decreased as one ascended the "intellectual" scale.

In another study concerned with the social

acceptance of EMR children, Lapp (1957) concluded that (1) the mentally-handicapped children were less accepted than the typical children, (2) the mentally-handicapped children were more rejected than the typical children, (3) acceptance steadily increased as IQ scores increased, (4) rejection steadily decreased as IQ scores increased, and (5) mentally-handicapped children were seldom rejected because of low academic ability--other reasons such as those related to unacceptable behavior were cited, e.g., bullying, fighting, lying, swearing, cheating, etc. These scores were obtained from schools having no special classes for the EMR children, and at least one EMR child in each class studied.

Blatt (1958) recognized the validity problem of the earlier academic studies, and attempted to conduct a somewhat similar study with more controlled factors by using students from two separate school systems, one with special classes for EMRs and one with no such services. His results showed that achievement of EMR children in special classes was not significantly different from achievement of EMR children in the regular classes. In addition, he found that, when compared with norms for typical nonretarded children of the same Mental Age, the special class and regular class EMR children achieved greater levels in total reading, total mathematics and total language scores than typical nonretarded children of

the same Mental Age. Again, it must be noted that similar bias effects were operating here, even though Blatt attempted control for them.

Blatt also studied the social aspects of the comparison groups. He found that the special class EMR children were more socially mature and emotionally stable than regular class EMR children. He did qualify the results by saying that the results may have been due to either subjective feelings on the part of the teachers, actual differences, or a combination of both. He also found no differences in the delinquency and behavior records for the two groups. When compared with norms for typical nonretarded children, Blatt found that both the special class children and the regular class EMR children had more personal and social adjustment problems than did typical children.

Baldwin (1958) conducted a study on the social position of the EMR child in the regular grades. The results of her study showed (1) the degree of social acceptance of the mentally retarded children in the regular grades was much lower than that of the nonretarded children in the regular grades, (2) the level of mental retardation, sex, chronological age and grade level of the mentally retarded children and the median intelligence of the class in which the mentally retarded children were placed did not seem to be significantly related, and (3)

the presence of other mentally retarded children within the same classroom did not seem to be related to the social acceptance of the mentally retarded children who were in a class with one or two mentally retarded children and those who were in a class with three or four mentally retarded children.

In 1959, Cassidy and Stanton compared two stratified samples of mentally handicapped children. Their results indicated the superiority in academic achievement of those enrolled in the regular grades as compared with those in the special classes. However, in the same study, the results showed superior social adjustment for the special class group. The superior social adjustment of the special class group was based on an evaluation of personal and social characteristics by means of items from the California Test of Personality, and clinical interpretations of the Goodenough Draw-a-Man test. The evaluation of their adjustment was within a protected environment and could not be interpreted in reference to the less protected environment of the regular class or the community. In addition, the superiority reflected the goals of the special class teachers, who, on a questionnaire, indicated that they were more interested in affecting social adjustment than academic achievement.

In a study by Thurstone (1959) of 1300 mentally retarded children, the data showed that on an evaluation

with the Stanford Achievement test, the children in the regular grades scored significantly higher than those in the special classes on all measures except arithmetic computation. The second test, administered a year later, showed no significant differences in the results. Sociometric and teacher ratings of the social acceptance and adjustment of the retarded children in the regular classes and the special classes showed a superiority of the special class retardates. As in the study by Johnson (1950), the children in the regular grades tended to be isolated by the typical children.

Mentally handicapped children in three different school environments were evaluated by Ainsworth (1959). The groups were: (1) special classes, (2) regular classes and (3) regular classes plus an itinerant teacher. Results showed all three groups made gains in academic areas over one year's period. The largest gains were found among the groups attending special classes and regular classes with no special services.

In a related study, Jordan (1959) attempted to measure the motivation of the retarded child in the regular class as compared with the retarded child in a special class. He found that the retarded child in the special class, although significantly lower in academic achievement, appeared to have far less fear of failure than the mentally retarded child in the regular grades.

Unfortunately, the study did not adequately control for the selection factor. If the data are substantiated, however, it might be evidence that the pressure of academic achievement in the regular grades is producing fear of failure, while a lack of emphasis on academic achievement in the special classes acts to decrease this fear of failure.

Goldstein, Moss and Jordan (1965) conducted a study which did have equivalent groups. They screened all children entering first grade in schools in three communities. All children with IQ scores below 85 were randomly assigned to regular or special classes. After four years, it was found that (1) both groups had raised their average IQ from 75 to 82, (2) neither group was superior in academic achievement, and (3) neither group was superior on a test of social knowledge.

Smith and Stroud (1960) assessed the effects of a comprehensive program on the development of mentally handicapped children. They found that their actual academic gains over a one year period of time were approximately one half of what would be anticipated.

The effects of the two different types of school programs, segregation and partial segregation, upon academic achievement were evaluated by Carroll (1967). The study was conducted in this manner to see if the setting could maximize the academic gains and minimize

social stigmatization. Each group was administered the Wide Range Achievement Test after the first month of schooling, and again after the eighth month. No special treatment was given to any of the subjects during the interim other than the actual class placement. After the eighth month period, both groups made significant academic gains when comparing direct individual difference scores. A group comparison of academic achievement based on the differences of the scores between the groups was also computed. Results indicated that the EMR integrated group showed significant growth in the area of reading, but no significant difference was found in the areas of spelling and arithmetic. Results also showed that the partially integrated group showed a very significant decrease in self-derogations, and the EMR segregated group showed a significant increase in self-derogations. These scores were a comparison of the direct individual difference scores. Comparisons of the group pretest and posttest scores were similar: EMR children in a segregated setting were significantly more derogatory of themselves than EMR children in a partially integrated setting.

Rubin, Senison and Betwee (1966) studied the efficacy of special day classes for other mildly handicapped children, including the emotionally handicapped, and revealed that these children did as well in the regular grades as in the special classes. They concluded

that there is little or no evidence that special class programming is generally beneficial to emotionally disturbed children as a specific method of intervention and correction.

Dunn (1968) in his article questioning the justification of special education for the mildly retarded feels the findings of the studies on the efficacy of special classes for the EMR constitute an argument for a change in the segregated class. He feels the results of the studies mentioned along with other related studies ". . . suggest consistently that retarded pupils make as much or more progress in the regular grades as they do in special education." He cites studies by Hoelke (1966) and Smith and Kennedy (1967) as even more conclusive evidence. Dunn feels Johnson (1962) has summarized the situation well in his quote:

It is indeed paradoxical that mentally handicapped children having teachers especially trained, having more money [per capita] spent on their education, and being designed to provide for their unique needs, should be accomplishing the objectives of their education at the same or at a lower level than similar mentally handicapped children who have not had these advantages and have been forced to remain in the regular grades. (p. 8)

Special classes for EMR children in the United States increased in enrollment nearly ten fold between 1922 and 1958. This increase would indicate an acceptance of the advantages of special classes over the retention of the EMR in the regular grades. To date, however, the

research has not justified the faith on which this acceptance is based.

The efficacy of special class placement has been studied in the main by comparing retarded children placed in special classes with retarded children left in the regular grades. The results of these numerous investigations have indicated that (1) the children left in the regular grades are, on the whole, superior academically to the children assigned to special classes, (2) possibly the children at the lower range of educability (low educable) show equal or superior academic achievement in the special class, (3) children assigned to special classes appear to be superior in social adjustment to those left in the regular grades, and (4) the retarded children in the regular grades tend to be isolated and rejected by their normal peers.

From the studies cited, there is almost universal agreement that the EMR children enrolled in special classes achieve, academically, significantly less than similar children who remain in the regular grades. The results in the areas of personal and social development are not in complete agreement. The only area in which the special class has demonstrated superiority of any significance is in peer acceptance.

Unfortunately, the majority of these studies were confounded by a number of factors including sample

selection, number of years in EMR or regular grades before the study, level of mental retardation, etc. Thus, until well controlled studies of a longitudinal nature are obtained, no adequate conclusions can be made.

Thurstone (1959) proposes a number of possible explanations for the results reported: (1) that mentally handicapped children profit from the stimulation provided by normal children in the regular class, (2) mentally handicapped children's motivation is reduced when they are placed in a special class, and (3) the emphasis of the special class is not on academic achievement. The latter would not explain the lack of positive results in the emotional and social areas. The entire orientation of the teacher and the atmosphere of the regular class is one of necessity for achievement. Since the standard is grade level, there is usually not much stimulation for the bright and superior child, but much for the normal, slow and mentally retarded child.

It is evident from the data reported that further studies need to be undertaken to determine which situation is best for the exceptional child. With the growing interest in, and changes towards, Mainstreaming, most exceptional children will likely be placed back in the regular classes. Segregated classes may exist only for the severely retarded. It is therefore imperative that we determine the type of atmosphere that will be most

conducive to the academic, social and emotional growth of the exceptional child. In view of the literature presented, it is noted that the effectiveness of special class placement of EMRs is still questionable. Similarly, there is no solid evidence, either positive or negative, to justify the special class for the EH child. The questions of the validity of teaching homogeneous groups of EH children have been left as yet unanswered.

The purpose of this study is to provide some scientific basis for academic evaluation of an EH program. Specifically, the purpose is to determine the effects of EH placement on the academic achievement of students in EH classes, both full time and part time. The following scientific hypothesis is in operation:

"The EH class has a significant effect on the academic gains of students."

This general hypothesis will be tested by the following specific null hypotheses:

Academic Gains of Total Population

1. The EH class has no significant effect on gains in Word Recognition (as determined by achievement on the Wide Range Achievement Test [WRAT]).
2. The EH class has no significant effect on gains in Spelling (as determined by

achievement on the WRAT).

3. The EH class has no significant effect on gains in Arithmetic (as determined by achievement on the WRAT).

Comparison of Academic Gains of the Fifteen Youngest Subjects and the Fifteen Oldest Subjects

4. There is no significant difference in academic gains in Word Recognition between the fifteen youngest subjects and the fifteen oldest subjects.
5. There is no significant difference in academic gains in Spelling between the fifteen youngest subjects and the fifteen oldest subjects.
6. There is no significant difference in academic gains in Arithmetic between the fifteen youngest subjects and the fifteen oldest subjects.

Comparison of Academic Gains of the Fifteen Subjects with the Longest Enrollment and the Fifteen Subjects with the Shortest Enrollment

7. There is no significant difference in academic gains in Word Recognition between the fifteen subjects enrolled for the longest period of time and the fifteen subjects enrolled for the shortest period of time.

8. There is no significant difference in academic gains in Spelling between the fifteen subjects enrolled for the longest period of time and the fifteen subjects enrolled for the shortest period of time.
9. There is no significant difference in academic gains in Arithmetic between the fifteen subjects enrolled for the longest period of time and the fifteen subjects enrolled for the shortest period of time.

Comparison of Academic Gains of the Fifteen Subjects
with the Highest IQ Scores and the Fifteen
Subjects with the Lowest IQ Scores

10. There is no significant difference in academic gains in Word Recognition between the fifteen subjects with the highest IQ scores and the fifteen subjects with the lowest IQ scores.
11. There is no significant difference in academic gains in Spelling between the fifteen subjects with the highest IQ scores and the fifteen subjects with the lowest IQ scores.
12. There is no significant difference in academic gains in Arithmetic between the fifteen subjects with the highest IQ scores and the fifteen subjects with the lowest IQ scores.

Correlation between Academic Gains
and IQ Scores

13. There is no significant correlation between academic gains in Word Recognition and IQ score.
14. There is no significant correlation between academic gains in Spelling and IQ score.
15. There is no significant correlation between academic gains in Arithmetic and IQ score.

CHAPTER II

METHOD

Subjects

The subjects for this study were drawn from a single upper-middle class, predominantly Caucasian school district. Subjects were those who were enrolled in classes for the Educationally Handicapped (EH) in the district on any level, and who were subsequently returned to a regular class on a full time basis. Data and information on the subjects was obtained through district files. All students who had the required data available were included in the study.

Out of a total population of one hundred forty-seven students, a total of sixty-three students, eleven female and fifty-two male, were included in the study. The remaining students had either left the district prior to returning to a regular class, or had incomplete data.

1. Subjects ranged in age from 6.8 years to 14.9 years with a mean age, at admittance to the program, of 10.5 years of age. The average grade level was 5.1.

2. IQ scores for the subjects ranged from eighty-one to one hundred twenty-five with a mean of 99.7. These

scores were obtained from individual EH evaluation sheets and are based on the Wechsler Intelligence Scale for Children (full scale) administered to each child at the time of his recommendation for EH class placement.

3. Length of stay in the EH class ranged from .7 year (seven months) to 5.2 years, with a mean of 2.31 years.

4. All subjects were those who had previously attended regular classes in this district. Subjects did not include any students who transferred from other schools directly into EH classes or directly from other district EH classes.

5. Subjects had never been enrolled in any type of Special Education program prior to entrance in the EH class. All subjects had previously been enrolled only in regular classes on a full time basis.

6. Subjects were enrolled in either a self-contained EH class on the elementary level or a Learning Disabilities Group (LDG) on the elementary, junior high or high school level. All subjects were considered EH regardless of class placement. Subjects enrolled in the self-contained class remained in the special class for the entire day. Subjects enrolled in the LDG classes received a part-time tutorial academic program. The program consisted of a maximum of two hours (up to three periods per day) in which the student received academic

instruction only. The remainder of the day was spent in regular, usually non-academic classes. Six of the sixty-three subjects or 10.5 percent of the subjects were enrolled in self-contained classes. The remainder of the subjects were enrolled in the LDG classes.

Procedure

All data were collected from district files on former EH students. The following data were collected on each child: age; date and grade at the time of admittance to, and dismissal from, the EH program; full scale IQ scores from the Wechsler Intelligence Scale for Children (WISC); and scores from the Wide Range Achievement Test (WRAT). All tests were administered by district school psychologists. The Wide Range Achievement Test was administered to each child at the time of his admission to the EH class, each year he continued in the program, and again at the time of his dismissal from the class. For the purposes of this study, only the scores from the WRAT administered at admission to and dismissal from the program were used. Every student with a complete file was included in the study. A total of sixty-three students were included.

The following measures were computed on each subject:

1. Total number of years enrolled in the

EH class.

2. Total number of years (academic) gained during EH class placement--based on grade placement scores according to the three sections of the WRAT: Word Recognition, Spelling and Arithmetic.
3. Total gains in each of the areas based on standard scores for the entire population.
4. Expected grade level at admittance to and dismissal from the EH class--based on each child's Chronological Age according to "Actual Grade Placements and Corresponding Grade Chronological Ages for Determining Intellectual Status Index" Table 19 taken from the California Achievement Test Manual.
5. Actual achievement level at admittance and dismissal date--determined according to the WRAT manual based on child's performance on test; based on Standard scores.
6. Differences between the subjects expected levels of achievement and actual levels of achievement at the time of admittance to and dismissal from the program.
7. Correlations between total population gains in each of the three areas of the WRAT and IQ scores.

The following additional subsamples were studied:

1. Academic gains of the fifteen oldest subjects as compared with the fifteen youngest subjects (upper and lower quartiles).
2. Academic gains of the fifteen subjects enrolled in the EH class for the longest period of time as compared with the fifteen subjects enrolled for the shortest period of time.
3. Academic gains of the fifteen subjects with the highest IQ scores as compared with the fifteen subjects with the lowest IQ scores.

T-tests were performed on all comparison groups using the formula for the mean of a population of differences between two measures for each individual found in Walker and Lev (1953, p. 153), and subsamples using the formula for the difference between two means found in Edwards (1954, p. 254) to determine statistical significance of the data at the .05 level of confidence. In addition, the correlation coefficient r using the correlation formula found in Edwards (1954, p. 147) was determined between each area of the WRAT and IQ scores.

CHAPTER III

RESULTS

The findings of this study were subjected to statistical analysis and the results are reported below. T-scores were computed and the stated hypotheses were tested for significant differences at the .05 level of confidence. In addition, r-correlations were computed and tested for significance at the .05 level.

Descriptive data relative to the sample population were presented in the previous chapters. Upon entry to the EH class, the average Chronological Age of subjects was 10.5 years of age. The mean achievement level, as computed by grade placement scores, was 1.65 years below grade level at admission to the EH class. Upon dismissal, the mean achievement level was 2.23 years below grade level.

At the time of entry to the EH class, the mean gain in the regular grades computed on a yearly basis was .67 years progress per year enrolled, based on grade placement scores. During the period of enrollment in the class, the mean gain per year was .74 years progress. This comparison is seen in Figure 1. As can be seen, the mean achievement level per year was greater for subjects

Mean Gain

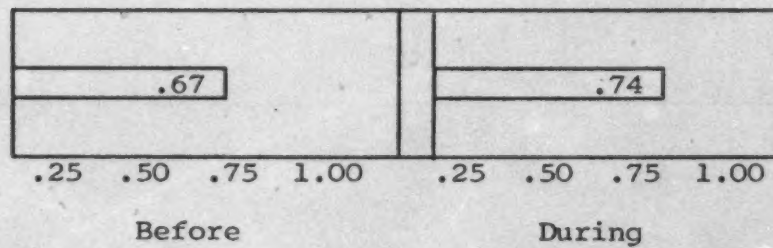


Figure 1

Average Progress per year based on Grade Placement
Scores Before and During EH Class Placement

while in the EH class.

At the time of entry to the EH class, the mean gain per year, as computed with grade placement scores in the three subtests of the WRAT was .67 years per year in Word Recognition, .60 years per year in Spelling and .75 years per year in Arithmetic. During the period of enrollment in the EH class, the mean gains per year in the three subtests were .93 years per year in Word Recognition, .61 years per year in Spelling and .63 years per year in Arithmetic. This data is seen in Table 1.

TABLE 1

COMPARISON OF MEAN GAINS PER YEAR IN EACH
SUBTEST OF THE WRAT BEFORE AND AFTER
EH CLASS PLACEMENT

	Word Recog.	Spelling	Arithmetic
Before	.67	.60	.75
After	.93	.61	.63

Gains were also computed for the mean period of enrollment in the EH class. The mean length of stay was computed to be 2.31 years. The mean gain overall, as computed by grade placement scores, was 1.70 years progress during the total length of enrollment. Mean gains in the three subtests were 2.14 years for Word Recognition, 1.40 years in Spelling, and 1.45 years in Arithmetic. This data is seen in Table 2.

TABLE 2
TOTAL MEAN GAINS DURING EH CLASS PLACEMENT

Mean Length of Stay	Word Rec.	Spell.	Arith.	Total Subtests
2.31	2.14	1.40	1.45	1.70

At the time of entry to the EH class, the mean standard score (SS) in the subtest of Word Recognition was 84.0. In Spelling, the mean SS was 81.0 and in Arithmetic the mean SS was 88.0. Upon dismissal from the EH class, the mean standard scores were 88.6 for Word Recognition, 81.5 in Spelling and 87.2 in Arithmetic. Table 3 presents this data. The table also shows the mean gains for each of the subtests as measured by SS. As shown, the mean gain in Word Recognition was 4.6, mean gain in Spelling was .5 and the mean change was -.8 in Spelling.

TABLE 3
MEAN STANDARD SCORES BEFORE AND AFTER
EH CLASS PLACEMENT

	Word Recog.	Spelling	Arithmetic
Before	84.0	81.0	88.0
After	88.6	81.5	87.2
Mean Gain	4.6	.5	-.8

The results of the tests performed on the null hypotheses are presented below.

Academic Gains of Total Sample

Null hypotheses 1, 2, and 3 stated that there is no significant difference between scores achieved in each of the three subtests of the WRAT administered at admission to and dismissal from the EH class, as measured by SS. A t-test was performed on each subtest to determine if any significant differences existed. A critical value of ± 1.9994 was determined necessary for significance. The results are seen in Table 4.

1. In the subtest of Word Recognition, the observed t-score for the difference between the means was 4.98. This score falls outside the confidence intervals at the .05 level of confidence for the sample, and therefore is significant. Thus, Hypothesis 1 is rejected.

There is a significant difference in Word Recognition after EH placement.

2. In the subtest of Spelling, a t-score of .48 was obtained. This score falls within the critical limits of t, and is therefore not significant. Hypothesis 2 cannot be rejected.

3. In the subtest of Arithmetic, a t-score of -.76 was obtained. This score also falls within the critical limits of t for the sample, and is therefore not significant. Hypothesis 3 cannot be rejected.

TABLE 4

DIFFERENCE BETWEEN MEAN GAINS OF STANDARD SCORES BEFORE AND AFTER EH CLASS PLACEMENT AS MEASURED BY STANDARD SCORES ON EACH SUBTEST OF THE WRAT

Word Recognition	Spelling	Arithmetic
4.98*	.48	-.76
*p < .05 t _{crit} = ±1.994		

Subsamples

In the three subsamples examined, the null hypotheses stated that there was no significant difference between each group. Groups were compared to determine if their gain scores differed significantly. If a significance was observed, the data were further examined to determine the causative factors, if possible.

Oldest vs. Youngest

Null hypotheses 4, 5, and 6 stated that there is no significant difference between the gains of the fifteen oldest subjects and the fifteen youngest subjects in each of the three subtests of the WRAT. A t-test of significance was performed on each subtest. A critical value of t was determined to be ± 2.048 . The results are seen in Table 5.

1. In the subtest of Word Recognition, a t-score of $-.371$ was obtained. This score falls within the limits set for t , and therefore is not a significant score. Thus Hypothesis 4 cannot be rejected.

2. In the subtest of Spelling, a t-score of $.303$ was obtained. This score also falls within the critical limits of t , and shows no significant difference. Hypothesis 5 cannot be rejected.

3. In the subtest of Arithmetic, a t-score of $-.216$ was obtained. Again, this score falls well within the limits set for t and indicates that no significant relationship exists between the means. Thus, Hypothesis 6 cannot be rejected. No significance was found in the comparisons of youngest subjects vs. oldest subjects.

TABLE 5

DIFFERENCE BETWEEN MEAN GAINS OF OLDEST
SUBJECTS AND YOUNGEST SUBJECTS AS
MEASURED BY STANDARD SCORES ON
EACH SUBTEST OF THE WRAT

	Word Rec.	Spell.	Arith.
Oldest	3.33	2.3	-.3
Youngest	4.33	1.4	.1
Mean Difference	-.371	.303	-.216
* $p < .05$ $t_{crit.} = \pm 2.048$			

Longest vs. Shortest

Null hypotheses 7, 8, and 9 stated that there is no significant difference between the academic gains of the fifteen subjects enrolled for the longest period of time and the fifteen subjects enrolled for the shortest period of time. A t-test of significance was performed on each subtest, and a critical value of t was determined to be ± 2.048 for the sample. Gain scores were computed on the basis of gains per year for each subject. The following results, as seen in Table 6, were obtained:

1. In the subtest of Word Recognition, a t-score of -2.108 was obtained. This score falls outside the critical limits of t, and is therefore significant. Thus, Hypothesis 7 is rejected.
2. In the subtest of Spelling, a t-score of -1.63 was obtained. This score falls within the critical limits of t and does not indicate a significance between the means. Hypothesis 8 cannot be rejected.
3. In the subtest of Arithmetic, a t-score of -1.85 was obtained. Again, this score falls within the limits of t, and indicates a significance does not exist between the means. Hypothesis 9 cannot be rejected. In this subsample, a significance between means was found only in the subtest of Word Recognition.

TABLE 6

DIFFERENCE BETWEEN MEAN GAINS OF SUBJECTS
ENROLLED THE LONGEST AND SUBJECTS
ENROLLED THE SHORTEST AS MEASURED
BY STANDARD SCORES ON EACH SUBTEST
OF THE WRAT

	Word Rec.	Spell.	Arith.
Longest	.8	-.4	-.5
Shortest	4.7	2.6	2.1
Mean Difference	-2.108*	-1.63	-1.85
*p < .05 $t_{crit.} = \pm 2.048$			

Further analyses of data collected from this subsample were done. Mean IQ scores for the two groups, mean grade level at entry to the program and mean number of years below grade level at entry were computed. The results are seen in Table 7. As reported, the mean IQ scores were 99.3 for the subjects enrolled longest and 95.5 for those enrolled shortest. Mean grade level at entry was 5.1 for subjects enrolled longest and 5.2 for subjects enrolled shortest. Mean number of years below grade level at entry was 1.9 for those enrolled longest and 1.6 for those enrolled shortest. None of the additional measures examined were found to be significantly different at the .05 level. Thus, other factors relating to the significance found could not be determined.

TABLE 7

ADDITIONAL COMPARISONS FOR SUBJECTS ENROLLED
LONGEST AND SUBJECTS ENROLLED SHORTEST

	Mean IQ	Mean Gr. Level	Mean No. Yrs. Below Gr. Level
Longest	99.3	5.1	1.9
Shortest	95.5	5.2	1.6

Highest IQ vs. Lowest IQ

Null hypotheses 10, 11, and 12 stated that there is no significant difference in gains between the fifteen subjects with the highest IQ scores and the fifteen subjects with the lowest IQ scores. A t-test of significance was performed on each of the three subtests of the WRAT, and a critical value of $t = \pm 2.048$ was determined necessary for significance in this sample. The following results, seen in Table 8, were obtained:

1. In the subtest of Word Recognition, a t-score of -2.17 was obtained. This score falls outside the critical limits of t and is therefore significant. Hypothesis 10 is rejected.

2. In the subtest of Spelling, a t-score of -2.07 was obtained. This score also falls outside the critical limits of t , and indicates a significant difference between means. Hypothesis 11 is rejected.

3. In the subtest of Arithmetic, a t-score of -1.85 was obtained. This score falls within the limits set for t and indicates that no significance exists between means. Hypothesis 12 cannot be rejected. Significance was obtained in the subtests of Word Recognition and Spelling, but not in Arithmetic for this subsample.

TABLE 8

DIFFERENCE BETWEEN MEAN GAINS OF SUBJECTS WITH
HIGHEST IQ AND SUBJECTS WITH LOWEST IQ
SCORES AS MEASURED BY STANDARD SCORES
ON EACH SUBTEST OF WRAT

	Word Rec.	Spell.	Arith.
Highest IQ	-.3	-2.3	-2.0
Lowest IQ	4.5	2.2	1.7
Mean Difference	-2.17*	-2.07*	-1.85
*p < .05 $t_{crit.} = \pm 2.048$			

Further analyses of the data collected from this subsample were done. Mean IQ scores of each group were computed, along with mean grade level at entry to the EH class, mean number of years in the program and mean number of years below grade level at admittance. The results of this examination of the data are seen in Table 9. As reported, the mean IQ scores for the groups were

one hundred fourteen for the highest IQ group and 86.6 for the lowest IQ group, nearly two standard deviations apart, as computed by standard deviations of the WISC. Mean grade levels at entry were 4.9 for the highest IQ group and 5.1 for the lowest IQ group. Mean number of years enrolled in the program was 2.3 for both groups. Mean number of years below grade level at entry to the program was -1.3 years for the highest IQ group and -1.6 years for the lowest IQ group. With the exception of the variance in IQ which was expected to differ significantly, indicating two distinctly separate populations, none of the other scores were significantly different at the .05 level.

TABLE 9
ADDITIONAL COMPARISONS FOR HIGHEST
IQ VS LOWEST IQ SUBJECTS

	Mean IQ	Mean Gr. Level	Mean No. Yrs. Enrolled	Mean No. Yrs. Below
Highest	114	4.9	-1.3	2.3
Lowest	86.5	5.1	-1.6	2.3

Correlations between Gains and IQ Scores

Null hypotheses 13, 14, and 15 stated that there is no significant correlation between gains and IQ scores in each of the three subtests of the WRAT. The correlation coefficient r was computed to determine if a relation exists between gains and IQ scores. With $N = 63$, a critical value of r was determined to be $\pm .246$. The results of the computations are seen in Table 10.

1. In the subtest of Word Recognition, an r of .08 was obtained. Since this score falls within the critical limits set for r , it is not significant. Thus, Hypothesis 13 cannot be rejected.

2. In the subtest of Spelling, an r of .12 was obtained. This score also falls within the critical limits set for r , and is therefore not significant. Hypothesis 14 cannot be rejected.

3. In the subtest of Arithmetic, an r of $-.06$ was obtained. Once again, this score falls well within the critical limits of r and indicates that no significance exists between the groups. Hypothesis 15 cannot be rejected. No significance was found between IQ scores and gains in any of the three subtests of the WRAT.

TABLE 10

CORRELATION BETWEEN GAIN SCORES & IQ SCORES OF TOTAL SAMPLE
AS MEASURED BY STANDARD SCORES ON THREE SUBTESTS OF WRAT

Word Rec.	Spell.	Arith.
.08	.12	-.06
$r_{crit.} = \pm .246$		

In summary, it is noted that only the following null hypotheses were rejected:

Hypothesis 1 - The EH class has no significant effect on gains in Word Recognition.

Hypothesis 7 - There is no significant difference in academic gains in Word Recognition between the fifteen subjects enrolled for the longest period of time and the fifteen subjects enrolled for the shortest period of time.

Hypothesis 10 - There is no significant difference in academic gains in Word Recognition between the fifteen subjects with the highest IQ scores and the fifteen subjects with the lowest IQ scores.

Hypothesis 11 - There is no significant difference in academic gains in Spelling between the fifteen subjects with the highest IQ scores and the fifteen subjects with the lowest IQ scores.

CHAPTER IV

DISCUSSION

The results of this research have shown that there is no significant overall difference between regular class and EH class placement of sixty-three children in both self-contained and Learning Disability Group classes as measured by Standard Scores on the WRAT. However, there were some individually significant differences between the two educational placements. These are seen below in the discussion of individual null hypotheses.

As can be seen in the data, the average gain in the EH program is approximately one-half month greater per year than in the regular class. When it is noted that the yearly gain in the EH class is .74 years per year, it is evident that the child will never make-up the months he has already lost, consequently never reaching grade level. However, it must be noted that this progress is greater than the progress of subjects in the regular grades, before EH intervention. Thus, it can be stated that there is some additional progress with EH intervention.

Academic Gains of Total Population

Significant results were obtained in the subtest of Word Recognition but not in the subtests of Spelling and Arithmetic, as shown in Table 4. Apparently, emphasis of instruction is placed on reading and vocabulary or word recognition. The teachers may have felt reading was more important and may have spent more class instruction time on this area. They may also have been more familiar with a number of effective remedial reading techniques. Emphasis on reading and word recognition does not seem to have generalized to spelling. Apparently, abilities necessary for decoding and processing words and sentences are different from those necessary for spelling. Additionally, the teachers may not have been familiar with effective remedial mathematics techniques. There is no means of determining within this study why mathematics scores did not increase, but the results may indicate that mathematics is a more difficult subject to remediate.

Oldest vs. Youngest

No significant results were obtained in the comparison of the oldest and youngest groups in any of the three subtests as seen in Table 5. Apparently, the age of the subject has no bearing on his ability to achieve in the EH class. Subjects have the potential to achieve the

same degree of success at any age or grade level, depending only on their ability. Although emphasis still remains on early diagnosis of learning deficits, the results of these comparisons would indicate that diagnosis of a deficit during the later years in school would not affect the student's opportunity to achieve. He may, however, be limited only by the number of years remaining in school.

Longest vs. Shortest

Significant results, shown in Table 6, were obtained in the subtest of Word Recognition, but not in the subtests of Spelling or Arithmetic for this comparison. No other additional factors examined, as seen in Table 7, could account for the significance obtained. Apparently, additional factors are affecting one group of subjects and not affecting the other group. It is possible that those enrolled for the shorter period of time may have been children with a mild learning disability. With EH placement, the disability may have been remediated to a level at which the child could succeed. In contrast, those enrolled for a longer period of time may have been more severely learning disabled and/or severe behavioral problems. Remediation may have been more difficult, resulting in the necessity of retaining the child in the class for a longer period of time, and perhaps even

increasing his frustration. It is also possible that the more severely involved children may have suffered from a failure syndrome at having been retained in the EH class, and their academic progress may have suffered as a consequence.

Table 6 also shows the mean gains of this group comparison for the subtests of Spelling and Arithmetic. As can be seen from the data, no significance was obtained, even though the mean scores are fairly widespread. The variance of individual scores within the groups would account for this. There does not seem to be any significant trend in gains, or losses, in the subtests of Spelling and Arithmetic and length of time enrolled. It is not clear why reading skills did not generalize to spelling; it would seem that a child who can read and sound out a word would be able to spell it. Perhaps remedial instruction centered on familiarity with and rote memorization of words rather than a phonics approach of sounding out letters. The lack of significant gain in mathematics may correlate with Hypothesis 3 which led to a conclusion that mathematics may be a more difficult subject to remediate, or require a longer period of time to effect a change.

Highest vs. Lowest

Significance was obtained in the subtests of Word

Recognition and Spelling, but not in the subtest of Arithmetic in this comparison as seen in Table 8. The data indicate that the significant gains were made in favor of the fifteen subjects with the lowest IQ scores. These results are contrary to what might have been expected. Thus, the data were further examined as seen in Table 9. However, as shown, none of the factors examined were significant enough to account for the differences. Apparently, other factors not examined in this study were accountable for the results. Since the mean IQ scores of the groups were significantly different, it is indicated that the groups are indeed two separate populations. Further research is necessary to determine the factors effecting differences. It is possible that the students with the lowest IQ scores were mildly learning disabled. If the EH class served to remediate the disability, they may have been able to succeed at a rate significant enough to allow for their return to the regular class. Conversely, the highest IQ group may have been more severely learning disabled and/or may have been more severe behavioral or emotional problems. Thus, remediation may have been more difficult, and may have centered more directly on the behavioral or emotional problem rather than on an academic remediation.

Correlations between Subtests and IQ

No significant results were obtained in these comparisons as shown in Table 10. As tested, there is no correlation between IQ scores and gains in each of the three subtests. The results do not support the results of Hypotheses 10 and 11 in which a significant difference in gains between subjects with the lowest and highest IQ scores was obtained in two of the three subtests. However, it must be noted that the difference in sample sizes, fifteen subjects in subsamples as compared with sixty-three subjects overall, may account for significance in one sample and no significance in another sample. In addition, the highest and lowest IQ groups were drawn from the upper and lower quartiles of the total population, and apparently the middle quartiles reduced the differences by bringing the scores closer to the mean. The remaining quartiles balanced the extremes.

From the results reported, it is evident that no significant factors affected the gains of the sixty-three subjects across all areas. The most significant gains were in the area of Word Recognition. Type of instruction or overall emphasis on reading and vocabulary remediation may account for the gains. Most "remedial" techniques are geared towards reading; there seems to be limited emphasis on remedial mathematics. In addition, mathematics may be

a more difficult subject to remediate, and require more time.

When significance was obtained in the subsamples, it could not be attributed to any of the additional factors examined in this research. The necessity for further research is indicated to pinpoint those factors causing the significant differences. Variation in teaching methods or instructional materials used may have accounted for the differences. The severity of the learning deficit or the presence of an emotional or behavioral problem may also be contributing factors. In addition, some of the subjects may have been receiving tutoring in outside clinics or workshops.

An alternative hypothesis that may account for the variations is home environment. Motivation and encouragement or support is vital to a child's success. The differences in home environment might possibly account for the differences in the subjects achievement.

Social interactions both at home and at school may be additional contributing factors. Peer relations that affect a child's attitude towards himself may also affect his motivation and success.

The labelling effect that Dunn (1968) writes about may be yet another contributing factor in this research. The problems of stigmatization, segregation from peers and labelling may have had adverse affects on some of the

subjects, while others may not have been as affected.

Because of the many possible contributing factors, it is essential that the question of the value of special class intervention for the EH child be critically examined in order to determine exactly what factors cause some children to succeed, and others to maintain their lower level of achievement.

CHAPTER V

IMPLICATIONS

With the results of this study indicating only limited gains in two areas related to reading, Word Recognition and Spelling and Arithmetic Computation, the value of such programs for the EH child may be questioned. At this point, educators might want to consider the cost of such programs in view of their effectiveness and consequent value.

The results showed that subjects did not achieve one year of academic gain per year enrolled in either the regular or EH class. They did, however, achieve slightly greater gains in the EH class. Thus, it can be said that the subjects did benefit somewhat from special class placement.

The EH class does seem capable of producing some significant differences in such areas as word recognition. However, acquisition of word recognition does not seem to generalize to spelling. Given a reading achievement test, subjects might show an increased ability in reading and comprehension, which cannot adequately be tested by the WRAT. The effect of the gains in word recognition skills

in other academic areas cannot be determined by the testing used in this study. In addition, written expression may have improved, yet there is no way of producing the data. Thus, all the positive aspects of gains in word recognition could not be determined here.

While the special class seems expensive in terms of the results, it may be that its most important value is in controlling children with behavioral problems and emotionally disturbed children. Again, such results would not be indicated on such measures as the WISC or WRAT.

There was some evidence that several subjects were able to leave the EH class after a short period of time and succeed in the regular class. Thus, it is possible that the EH class functions in a capacity similar to Morse's (1965) "Crisis Room." The class may serve to see a child through a crisis; educational, behavioral or emotional, and to ward off the possibility of additional and more severe crises. It may also serve as a temporary placement for children under stress.

Further research might suggest a more efficient use of the EH class since it represents a great deal of administrative and professional cost. There appear to be groups of subjects who make significant gains after only a short period of time, even with low IQ scores. Research along these lines might uncover information as to what factors are affecting certain subjects causing them to

achieve at a faster rate. Research might also lead to a discovery of the benefits of the EH class which do not have anything to do with academic ability. We may find that the EH class is successful in improving personality and attitude in the child which enables him to work more efficiently and achieve greater gains.

The data suggest that there may be factors which result in some subjects achieving very significant gains in the EH class. Case history research might uncover some of these factors. This research might also suggest reliable methods of differential diagnosis, i.e., differentiating types of subjects who would be successful and might benefit more from a short term intervention program from those who would need some other type of long term intervention strategy. Perhaps an entirely different type of program would be necessary for those who would not benefit from short term intervention. The research might indicate that there are two subpopulations within the EH population: those who can benefit from a short term intervention and can return to the regular class, and those who are in need of more extensive help.

Close examination of this data in addition to further research may result in a more precise definition of the type of educational placement necessary for the EH child. The need for further research in this area is vital.

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